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High Pressure structural investigation of promising optical materials

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The significance of pressure effects in materials science comes from structure and property relationships with emphasis on the synthesis and study of phase transitions. Besides temperature, pressure can also induce changes in the structural properties of transitional metal oxides because it directly affects atomic interactions by altering interatomic distances. Structural and electronic transitions have been observed by applying high pressure: we can mention, for example, the induced superconductivity at low temperature [1]. In this presentation, we will report high pressure investigations on the structural properties of several orthovanadates. These systems can be employed in a number of applications including their use as promising optical materials [2]. These studies were carried out by means of X-ray diffraction (XRD) measurements using diamond anvil cells. In situ HP-XRD was performed at MSPD beamline of ALBA synchrotron. The structure of the different phases has been refined and their equation of state (EOS) determined. Theoretical calculations fully agree with the experimental results. We will discuss here the structure of the high pressure phases and the compressibility of these systems in the light of experimental results and according to theoretical calculations.

References

1. H. Takashi, K. Igawa, K. Arii, Y. Kamahara, M. Hirano, H. Hosono, Nature. 453, 376 (2008).
2. D. Errandonea, R. Lacomba-Perales, J. Ruiz-Fiertes, A. Segura, S.N. Achary, A.K. Tyagi, Phys. Rev. B 79, 184104 (2009) and references therein.

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